

RemarksAmendment to the Specification

Applicant has amended the Specification to consistently refer to reference numerals 104 and 106 as the midplane sleds.

Claim rejections

Claims 1 to 20 were pending when last examined. With this Response, Applicant amends claims 1, 7, 9, 12, 15, and 19, and adds claims 21 to 25.

§ 102 Rejections

The Examiner rejected claims 12 to 14 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,247,427 ("Driscoll et al."). The Examiner stated:

With respect to claims 12-14, Driscoll et al. teaches a midplane sled (33-1-33-20) comprising a floor (53); opposing sidewalls (59) disposed on the floor (53) and oriented in orthogonal relationship with the floor (53); a front wall (57) having an opening, a first side and a second side, and being disposed on the floor (53) and oriented in orthogonal relationship with the floor (53) and side walls (59); a first connector (73); a second connector (see figure 8); a third connector (see next of first connector 73), and a guide disposed on the floor (53) as claimed (see for example figures 8-18 and column 4 line 46 through column 6 line 53).

June 17, 2003 Office Action, p. 2 (emphasis added).

Applicant has amended independent claim 12, which now recites:

12. A midplane sled comprising:

a floor;

opposing sidewalls disposed on the floor and oriented in orthogonal relationship with the floor;

a front wall midplane disposed on the floor and oriented in orthogonal relationship with the floor, the front wall midplane being oriented in orthogonal relationship with each of the sidewalls, the front wall midplane having first and second sides;

an opening formed in the front wall midplane;

tabs extending from the front wall midplane adjacent the first side of the front wall midplane for mating with corresponding slots in a chassis;

a first connector attached to the first side of the front wall midplane for mating with a corresponding connector of a device sled;

a second connector attached to the second side of the front wall midplane for mating with a corresponding connector of an air displacement unit removably disposed in the midplane sled.

Claim 12 (emphasis added).

Driscoll et al. does not disclose a midplane sled having a front wall midplane with a connector on one side for connecting to an air displacement unit removably disposed in the midplane sled. Driscoll et al. only discloses a drive drive module 33-1 that has a rear wall 57 with a connector on its backside for connecting to a backplane 31.

Referring now to FIGS. 9-12, disk drive module 33-1 is shown in greater detail. As can be seen, module 33-1 includes an elongated, generally rectangular, unitary frame 49 (see also FIGS. 13 through 15 wherein frame 49 is shown separately). Frame 49 includes a top wall 51, a bottom wall 53, a front wall 55, a rear wall 57, and a side wall 59. ...

...

Mounted within frame 49 are a 3.5 inch disk drive 67, a regulator card 69, and a ribbon cable 71. Ribbon cable 71 electrically connects disk drive device 67 to regulator card 69.

The rear edge of regulator card 69 includes an edge connector 73 which extends rearwardly a short distance beyond rear wall 57 and is mateable with an electrical connector 45 on the front side on backplane 31. To ensure that edge connector 73 is properly guided into interengagement with an electrical connector 45 when disk drive module 33 is slid into position within chassis 13, regulator card 69 is mounted on frame 49 so that it can move in three directions.

Driscoll et al., col. 5, line 25 to col. 6, line 11 (emphasis added). Thus, Driscoll et al. only teaches that disk drive module 33-1 has a rear wall 57 with a connector for connecting to a backplane 31. Accordingly, amended claim 12 is patentable because Driscoll et al. does not disclose or suggest a midplane sled with a front wall midplane having "a second connector attached to the second side of the front wall midplane for mating with a corresponding connector of an air displacement unit."

Claims 13 and 14 depend from amended claim 12 and are patentable over Driscoll et al. for at least the same reasons as amended claim 12.

§ 103 Rejections

The Examiner rejected claims 1, 3, and 6 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,899,254 ("Ferchau et al.") in view of U.S. Patent No. 6,459,571 ("Carteau"). The Examiner stated,

With respect to claims 1 and 6, Ferchau et al. teaches an enclosure (2) comprising a chassis (4) having a floor and opposing sidewalls; a first midplane (14) having an opening formed therein; wherein the midplane (14) is operable to be secured in an interior of the chassis (4) between the sidewalls and orientated in orthogonal relationship to the sidewalls; wherein the midplane (14) is configured to mate to at least one air displacement unit (82) on a back surface of the midplane (14) parallel to the sidewalls of the chassis (4), and to mate to at least one device sled (10, 24) on a front surface of the midplane (14); wherein each opening is aligned with at least one of the air displacement units (82) as claimed (see for example figures 2A and 2B). However, the apparatus of Ferchau et al. lacks a clear teaching of the midplane (14) being a discrete first and second midplane, a shelf being disposed on at least one of the sidewalls, and controller mounted on the shelf and connected to the midplane as claimed. Carteau is relied upon for its teaching of a chassis (20) having discrete first and second midplane (25A, 25B), a shelf (30A, 30B) being disposed on at least one of the sidewalls, and a controller (29) mounted on the shelf (30A, 30B) and connected to the midplane (25A, 25B) as claimed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Carteau into the apparatus of Ferchau et al. to aid in repairing a defective midplane without having to take the system "offline", thus improving redundancy.

June 17, 2003 Office Action, p. 3 (emphasis added). Applicant respectfully traverses.

Examiner cited sideplanes 25A and 25B of Carteau as the "discrete first and second midplanes ... operable to be secured in an interior of the chassis between the sidewalls and orientated in orthogonal relationship to the sidewalls" recited by claim 1. However, sideplanes 25A and 25B, as suggested by their names, are parallel instead of "orthogonal ... to the sidewalls" as recited by claim 1. This can be clearly seen in Figs. 5 and 6. Furthermore, Carteau touts this orientation as an advantage over the prior art shown in Fig. 3, where a midplane 4 is orthogonal to the sidewalls and therefore impedes airflow through the cabinet.

Arrows 32, 33 represent airflow through the cabinet by the use of conventional fans (not shown in detail), and it will be particularly observed that the airflow is generally parallel to the planes of the sideplanes 25A, 25B. Therefore, it will be appreciated that a major drawback of the prior art, the necessity to provide apertures in the connector planes receiving disk drive arrays resulting in the aforementioned drawbacks. Accordingly, cooling of the components of the mass storage unit is very much improved over the prior art mass storage units.

Carteau, col. 3, lines 40 to 49. Thus, Carteau does not disclose or suggest, and in fact teaches away from, "discrete first and second midplanes ... orientated in orthogonal relationship to the sidewalls" as cited by claim 1. Accordingly, claim 1 is patentable over Ferchau et al. in view of Carteau.

Claims 3 and 6 depend from claim 1, and are patentable over Ferchau et al. in view of Carteau for at least the same reasons as claim 1.

The Examiner rejected claims 2 and 7 to 10 under 35 U.S.C. §103(a) as being unpatentable over Ferchau et al. in view of Carteau and further in view of U.S. Patent No. 6,459,589 ("Manweiler et al.").

Claim 2 depends from claim 1, and is patentable over the combination of Ferchau et al., Carteau, and Manweiler for at least the same reasons as claim 1 discussed above.

Independent claim 7 recites:

7. An enclosure comprising:

a chassis having a floor, first and second sidewalls disposed on opposite sides of the floor, and a divider wall disposed on the floor between the first and second sidewalls;

first and second midplane sleds, each midplane sled having a front wall midplane and a hole formed through the front wall midplane, the front wall midplane having first and second surfaces, the first surface of the front wall midplane being configured to connect to at least one device sled and the second surface of the front wall midplane being configured to connect to at least one power supply unit;

the first midplane sled being removably disposed between the first sidewall and the divider wall and the second midplane sled being removably disposed between the second sidewall and the divider wall;

first device sleds removably disposed between the first sidewall and the divider wall and adjacent the first midplane sled;

second device sleds removably disposed between the second sidewall and the divider wall and adjacent the second midplane sled.

Claim 7 (emphasis added).

Ferchau et al., Carteau, and Manweiler do not disclose or suggest "first and second midplane sleds, each midplane sled having a front wall midplane ..., the front wall midplane having first and second surfaces, the first surface of the front wall midplane being configured to connect to at least one device sled and the second surface of the front wall midplane being configured to connect to at least one power supply unit" as recited in claim 7. As discussed above and acknowledged by the Examiner, Ferchau et al. does not disclose discrete midplanes and therefore cannot disclose or suggest the midplane sleds each having a front wall midplane. As discussed above, Carteau teaches against a midplane in favor of sideplanes, and therefore cannot disclose or suggest the midplane sleds each having a front wall midplane. Manweiler discloses only "a single center pluggable midplane board." Manweiler, col. 5, line 52 to 53. Thus, Manweiler does not disclose or suggest the midplane sleds each having a front wall midplane. Accordingly, claim 7 is patentable over the combination of Ferchau et al., Carteau, and Manweiler.

Claims 8 to 10 depend from claim 7, and are patentable over the combination of Ferchau et al., Carteau, and Manweiler for at least the same reasons as claim 7.

The Examiner rejected claims 4 and 15 to 20 under 35 U.S.C. § 103(a) as being unpatentable over Ferchau et al. in view of Carteau and further in view of U.S. Patent No. 3,905,484 ("Dean et al."). Claim 4 depends from claim 1 and is patentable for at least the same reasons as claim 1 discussed above. Applicant has amended independent claim 15 to further distinguish the cited references. Amended independent claim 15 now recites:

15. A chassis comprising:

a floor;

first and second sidewalls adjacent the floor;

a divider wall running the length of the floor and positioned between the first and second sidewalls, the divider wall oriented in parallel relationship with the sidewalls;

guides for device sleds disposed on the floor on opposite sides of the divider wall and oriented in parallel relationship with the sidewalls;

a shelf mounted on the first sidewall, the shelf permitting mounting thereon a controller for devices on the device sleds;

slots positioned adjacent the first and the second walls and on opposing sides of the divider wall.

Claim 15 (emphasis added).

The Examiner cited Carteau for disclosing "a shelf (30A, 30B) being disposed on at least one of the sidewalls, and a controller (29) mounted on the shelf (30A, 30B) and connected to the midplane (see Carteau)" June 17, 2003 Office Action. However, Carteau only discloses that controller 29 is located behind drawers 21 and 22 and drawers 21 and 22 are slidably mounted on drawer rails 30A and 30B. "Drawer rails 30A support the drawer 21 in the cabinet 20; similarly, drawer rails 30B support the drawer 22; thus, each of the drawers 21, 22 can be independently opened for access to the disk drive canisters 24A, 24B for service, hot swaps, etc." Carteau, col. 3, lines 24 to 28. See also Figs. 5 and 6 of Carteau. Thus, Carteau does not disclose or suggest "a shelf mounted on the first sidewall, the shelf permitting mounting thereon a controller for devices on the device sleds" as recited by claim 15.

Although not specifically cited, Applicant assumes the Examiner intended to cite Manweiler et al. for disclosing a divider wall as recited in claim 15. Applicant has amended claim 15 to recite "a divider wall running the length of the floor." In contrast, Manweiler et al. only discloses a divider wall 50 that runs partially along the length of the floor because divider wall 50 abuts a center support 44 onto which a midplane board 76 is mounted. In one embodiment of the present invention, the divider wall runs the entire length of the floor because two midplane sleds are removably disposed on either side of the divider wall, which is claimed later in claims 17, 18, and 20. Accordingly, claim 15 is patentable over the combination of Ferchau et al., Carteau, Manweiler, and Dean et al.

Claims 16 to 20 depend from claim 15 and are patentable over the cited references for at least the same reasons as claim 15.

The Examiner rejected claim 5 under 35 U.S.C. § 103(a) as being unpatentable over Ferchau et al. in view of Carteau and further in view of U.S. Patent No. 6,411,506 ("Hipp et al."). Claim 5 depends from claim 1 and is patentable over the cited references for at least the same reasons as claim 1 discussed above.


The Examiner rejected claim 11 under 35 U.S.C. § 103(a) as being unpatentable over Ferchau et al. in view of Carteau, Manweiler et al., and Hipp et al. Claim 11 depends from claim 7 and is patentable over the cited references for at least the same reasons as claim 7 discussed above.

New Claims

Applicant has added claims 21 to 25. Claim 21 recite "a chassis ...; a midplane located in the chassis ..., the midplane defining an opening so the air displacement unit displaces air through the opening to cool the disk sled; and the air displacement unit comprising a first fan adjacent to a front surface of the air displacement unit ... and a second fan adjacent to a rear surface of the air displacement unit." Claim 21 (emphasis added). Claim 21 is supported by the Specification on p. 4, lines 18 to 23. The cited references do not disclose or suggest a midplane defining an opening mated with an air displacement that has a fan at a front surface and a fan at a rear surface. Accordingly, claim 21 is patentable over the cited references.

Claims 22 to 25 depend from claim 21 and are patentable over the cited references for at least the same reason as claim 21.

In summary, claims 1 to 20 were pending in the above-identified application when last examined. This Response amends claims 1, 7, 9, 12, 15, and 19, and adds claims 21 to 25. For the above reasons, Applicant respectfully requests the Examiner with withdraw the claim rejections and allow claims 1 to 25. Should the Examiner have any questions, please call the undersigned at (408) 382-0480.

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Respectfully submitted,



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